



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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January 7, 1999

Greg Hawkins, Mine Manager
Brush Wellman Inc.
P.O. Box 815
Delta, Utah 84624

Re: Conditional Approval of Amendment to Large Mining Operations, Brush Wellman Inc., Topaz Beryllium Mine, M/023/003, Juab County, Utah

Dear Mr. Hawkins:

The Division has completed a review of your permit amendment to the approved Topaz Beryllium Mine mining and reclamation plan, located in Juab County, Utah. The application was originally received August 26, 1998. We hereby grant *conditional approval* of this permit amendment.

The amendment was submitted based upon a required change in mine plan scheduling. The change will result in the enhancement of the mine plan by including some pits which were previously planned to be mined, but where the footprint was originally considered too small to feasibly mine at current day production levels.

As a consequence of this change, the new proposed Rainbow #2 pit will include most of the area involved with the previously approved Rainbow #2 and #3 pits. Similarly, the proposed Section 16 South #1 pit will now include the area of the currently approved Section 16 - North #2 and South #1 pits. The current steady state reclamation surety amount is based on a complex balance sheet of projected mine development activities with concurrent reclamation and release of reclaimed areas. With the development changes proposed in this amendment, this steady state bond amount will be exceeded for an estimated four year period. Eventually annual concurrent reclamation of the disturbed/mined out areas will again catch up with the approved mine development sequence.

Other changes under this amendment will include an overall enhancement of the reclamation plan. As the areas to be mined become better defined, the operator can implement improved land forming and recontouring ideas to improve blending the reclaimed areas into the surrounding topography. The operator has also suggested the use of substitute growth materials (i.e., gravel deposits in the Rainbow expansion area) to enhance reclamation of areas which would normally have had little or no topsoil applied. The gravel should improve soil textures and provide some additional fine soil material which will enhance successful reclamation of disturbed areas. This amendment improves and redefines the existing plan with a more realistic mining scenario and an enhanced reclamation plan.

These areas have been field verified and approved by the Division and are now included as part of the reclamation plan. The following mine plan acreages and surety figures have also been changed:

- Newly proposed disturbed area outside of the original pit boundaries is; 10 acres for the Section 16 - South #1, and 12 acres on the Rainbow #2 for a **total** of 22 acres. The total permitted acreage for the entire mine is 1189 acres.
- \$179,400 (year 2000 dollars) escalated surety amount has been calculated for this amendment. This dollar amount is in addition to the originally approved \$311,300 self bond surety amount. This additional surety will be held by the Division until the concurrent regrading and reclamation activities again balance out with the projected annual mine development sequence. This additional surety amount is acceptable to the Division, BLM, and SITLA and could be posted as a separate surety bond.

An additional \$27,400 reclamation surety amount will also be required for years 2001-2003. This surety will remain in effect until the self bond comes up for review in 2003 (see attached calculation sheets). This additional amount was not contemplated in the initial amendment submitted by Brush Wellman. After we reviewed the original 1988 plan and surety calculations, Brush Wellman was contacted and agreed that an additional \$27,400 surety amount would be acceptable to cover the proposed changes in mining and reclamation scheduling for years 2001-2003. We contacted Ron Teseneer of the BLM and Will Stokes of SITLA and received their concurrence on this supplemental bonding amount. ***The self bond will be reevaluated in 2003 and all bonding parameters will be updated at that time.***

The additional adjustments to the existing steady state bond amount are based upon an updated chronological schedule for mining the Rainbow #2 and the Section 16 - South #1 deposits. The original approved permit application anticipated mining these areas, (with the exception of @22 new acres), but under a different development schedule.

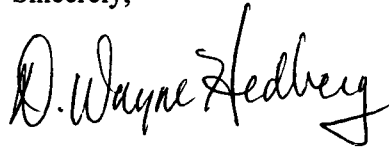
As a result of these scheduling changes and the need for additional ore earlier than anticipated, the reclamation costs are reflected differently in terms of the years in which they are encountered. Attached is Table 8.0-1 "*Projected Reclamation Liability Incurrence and Release Dates, updated August 1998*" and Table 8.0-2 "*Cumulative Reclamation Liability with Data from Updated Table 8.0-1.*" Both of these tables show the maximum liability to occur in the year 2000 at \$295,000. These tables are also the source of the information used to calculate the excess surety over and above the self bond. It is our understanding that appropriate archeological and threatened and endangered (T & E) plant clearances have been obtained for any new disturbances proposed on federal and state lands.

Brush Wellman will need to formally notify us of its acceptance to the additional bonding requirements for the years 2001-2003. You do not need to post the supplemental \$27,400 (year 2001-2003) surety amount at this time. However, before we can grant final approval of this amendment, we will need to receive the additional \$179,400 surety and complete an updated Reclamation Contract form.

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Greg Hawkins
M/023/003
January 7, 1999

As always, our approval does not grant permission to proceed ahead with this amendment without first obtaining the required permits or approvals from all appropriate federal, state and local regulatory entities. If you have any questions in this regard please contact me or Tom Munson of the Minerals Staff. If you wish to arrange a meeting to sit down and discuss this review, please contact us at your earliest convenience. Thank you for your cooperation in completing this permitting action.

Sincerely,

A handwritten signature in black ink that reads "D. Wayne Hedberg". The signature is fluid and cursive, with the first name "D." and last name "Hedberg" clearly legible.

D. Wayne Hedberg
Permit Supervisor
Minerals Regulatory Program

jb

Attachments: Calculation sheet; tables 8.0-1 & 8.0-2, Brush bonding calculations;
DOGM 1988 bonding figures (2); Map (plate 2.0-1C);
Forms MR-6 and MR-RC

cc: Will Stokes, SITLA
Ron Tessner, BLM
Mary Ann Wright, DOGM w/o attachments
m23-03.rev

TABLE 8.0-1 PROJECTED RECLAMATION LIABILITY INCURRENCE
AND RELEASE DATES

2008 Fluro #2 Pit	Construct Pit Berm	\$ 100.00	2009
Fluro #1 Pit	Cover Tuff Disposal Cell	\$ 1,300.00	2008
	Reveg Backfilled Pit	\$ 2,000.00	2011
Roadside I&II	Topsoil 1/2 Backfilled Pit	\$ 28,900.00	2009
1 Roadside I&II (cont.)	Reveg 1/2 Backfilled Pit	\$ 9,600.00	2012
	2008 Total	\$ 38,600.00	
2009 Sec 16 S #2 Pit	Construct Pit Berm	\$ 100.00	2010
Sec 16 Dump	Topsoil 4/3 63% Dump	\$ 54,191.00	2010
	Reveg 4/3 63% Dump	\$ 10,319.00	2013
	Topsoil 4/3 37% Backfilled Pit	\$ 15,873.00	2010
	Reveg 4/3 37% Backfilled Pit	\$ 3,219.00	2013
	2009 Total	\$ 83,702.00	
2012 Rainbow #3 Pit	Construct Pit Berm	\$ 200.00	2013
20002000 Rainbow Dump	Rip 1/2 Dump Top	\$ 5,800.00	20042019
	Reveg 1/2 Dump	\$ 8,400.00	2004-2022
	2012 Total	\$ 14,400.00	
2013 Blue Chalk N #3 Pit	Construct Pit Berm	\$ 100.00	2014
1998 Blue Chalk N #2 Pit	Cover Tuff Disposal Cell	\$ 4,900.00	2017
	Reveg Backfilled Pit	\$ 8,800.00	2020
	2013 Total	\$ 100.00	
2016 Monitor #3 #1 Pit	Construct Pit Berm	\$ 200.00	2017
Monitor Dump	Topsoil 1/3 Dump	\$ 66,800.00	2017
	Reveg 1/3 Dump	\$ 13,200.00	2020
	2016 Total	\$ 80,200.00	
2017 Blue Chalk S #3 Pit	Construct Pit Berm	\$ 200.00	2018
	2011 Total	\$ 200.00	
2020 Camp #1 Pit	Construct Pit Berm	\$ 300.00	2021
Camp Dump	Topsoil Dump	\$ 62,900.00	2021
	Reveg Dump	\$ 14,700.00	2024
	2020 Total	\$ 77,900.00	
2024 Southwind #1 Pit	Construct Pit Berm	\$ 400.00	2025
Southwind Dump	Topsoil Dump	\$ 72,300.00	2025
	Reveg Dump	\$ 18,900.00	2028
	2024 Total	\$ 91,600.00	
2030 Sec 16 N #3	Construct Pit Berm	\$ 100.00	2031
	2030 Total	\$ 100.00	

RECEIVED
8/26/1998

(1) Work Completed

1991 Section 16 N #1	Construct Pit Berm	\$ 200.00	1992 (1)
	1991 Total	\$ 200.00	
1993-1996 Monitor #1 #3 Pit	Construct Pit Berm	\$ 200.00	1994-1998
Monitor Dump	Topsoil 1/3 Dump	\$ 66,800.00	1994-1998
	Reveg 1/3 Dump	\$ 13,200.00	1997-2001
	1993-1996 Total	\$ 80,200.00	
1994-1996 Blue Chalk S N #2 Pit	Construct Pit Berm	\$ 200.00	1995-1998
	1994 1996 Total	\$ 80,400.00	
<u>2000/2001</u>			
1998 Rainbow #1 Pit	Cover Tuff Disposal Cell	\$ 2,950.00	2001
	Reveg Backfilled Pit	\$ 5,050.00	2004
1997 Rainbow #2 Pit	Construct Pit Berm	\$ 200.00	2001-1998
Rainbow Dump	Rip 1/2 Dump Top	\$ 5,800.00	2004-2019
	Reveg 1/2 Dump	\$ 8,400.00	2004-2022
Expanded Dump	Rip Dump Top	\$ 3,400.00	2004
	Reveg Dump	\$ 4,924.00	2004
1998 Sec 16 S #1 Pit	Construct Pit Berm	\$ 200.00	2001-2006
Sec 16 N #1 & 2	Construct Pit Berm	\$ 400.00	2001-2006
Sec 16 N #1 & 2 & S #1	Topsoil 1/3 63% Backfilled Pit	\$ 27,027.00	2001-1999
	Reveg 1/3 63% Backfilled Pit	\$ 5,481.00	2004-2002
Sec 16 Dump	Topsoil 1/3 37% Dump	\$ 47,654.00	2001-1999
	Topsoil Remainder 2001 Dump	\$ 81,143.00	2010
	Reveg 1/3 37% Dump	\$ 9,074.00	2004
	Reveg Remainder 2001 Dump	\$ 15,451.00	2013
1998 Blue Chalk S #2 Pit	Cover Tuff Disposal Cell	\$ 4,900.00	2017
	Reveg Backfilled Pit	\$ 8,800.00	2020
	1998- Incurred but not reclaimed		
	<u>until 2000/2001 Total</u>	\$ 217,154.00	
2004 Roadside/Fluro #4 Pit	Construct Pit Berm	\$ 100.00	2005
Roadside I&I	Topsoil 1/2 Backfilled Pit	\$ 28,900.00	2005
	Reveg 1/2 Backfilled Pit	\$ 9,600.00	2008
Roadside/Fluro Pit	Cover Tuff Disposal Cell	\$ 7,100.00	2008
	2004 Total	\$ 45,700.00	
2004 2005 Monitor #2 Pit	Construct Pit Berm	\$ 100.00	2005 2002
Monitor Dump	Topsoil 1/3 Dump	\$ 66,800.00	2006 2002
	Reveg 1/3 Dump	\$ 13,200.00	2009 2005
2002 Blue Chalk N S #2 Pit	Construct Pit Berm	\$ 200.00	2003
2005 Sec 16 Dump	Topsoil 1/3 Backfilled Pit	\$ 14,300.00	2006
	Reveg 1/3 Backfilled Pit	\$ 2,900.00	2009
	Topsoil 1/3 Dump	\$ 69,800.00	2006
	Reveg 1/3 Dump	\$ 11,400.00	2009
	2005 Total	\$ 88,600.00	

Table 8.0-2 Cumulative Reclamation Liability									
With Data From Updated Table 8.0-1									
Year	Increased Liability	Released Liability	Actual Released Liability	Year	Cumulative Total	Adjustments Per 1998 Plan		Revised Year	Cumulative Total
	Per 1988 Plan	Per 1988 Plan	Per BWI, 1998	Total	Per 1988 Plan	Incurrence	Release	Total	Per BWI, 1997
1988	196,800	15,800	15,800						\$ 181,000
1988 (post reclamation)	181,000	0	0	181,000	181,000	\$ (19,300)	\$ -	\$ 161,700	\$ 161,700
1989	0	20,400	20,400	-20,400	160,600	\$ -	\$ -	\$ (20,400)	\$ 141,300
1990	0	3,000	3,000	-3,000	157,600	\$ -	\$ -	\$ (3,000)	\$ 138,300
1991	200	0	0	200	157,800	\$ -	\$ -	\$ 200	\$ 138,500
1992	0	58,500	58,500	-58,500	99,300	\$ -	\$ -	\$ (58,500)	\$ 80,000
1993	80,200	2,300	2,300	77,900	177,200	\$ (80,200)	\$ -	\$ (2,300)	\$ 77,700
1994	200	67,000	0	-66,800	110,400	\$ (200)	\$ (67,000)	\$ -	\$ 77,700
1995	0	11,700	11,500	-11,700	98,700	\$ -	\$ (200)	\$ (11,500)	\$ 66,200
1996	0	0	0	0	110,400	\$ 80,400	\$ -	\$ 80,400	\$ 146,600
1997	200	13,200	0	-13,000	85,700	\$ (200)	\$ (13,200)	\$ -	\$ 146,600
1998	102,200	5,000	5,000	97,200	182,900	\$ (102,000)	\$ 63,400	\$ (68,200)	\$ 78,400
1999	0	74,100	0	-74,100	108,800	\$ -	\$ (74,100)	\$ -	\$ 78,400
2000	0	0		0	108,800	\$ 217,100	\$ -	\$ 217,100	\$ 295,500
2001	80,200	14,500		65,700	174,500	\$ (80,200)	\$ 77,100	\$ (91,600)	\$ 203,900
2002	200	81,300		-81,100	93,400	\$ -	\$ (81,200)	\$ 100	\$ 204,000
2003	0	200		-200	93,200	\$ -	\$ -	\$ (200)	\$ 203,800
2004	45,700	10,100		35,600	128,800	\$ -	\$ 38,400	\$ (2,800)	\$ 201,000
2005	88,600	42,200		46,400	175,200	\$ (8,300)	\$ (13,100)	\$ 51,200	\$ 252,200
2006	0	74,400		-74,400	100,800	\$ -	\$ (7,600)	\$ (66,800)	\$ 185,400
2008	38,600	31,000		7,600	108,400	\$ 3,300	\$ 1,300	\$ 9,600	\$ 195,000
2009	88,500	43,500		45,000	153,400	\$ (4,800)	\$ (1,100)	\$ 41,300	\$ 236,300
2010	0	74,900		-74,900	78,500	\$ -	\$ 73,500	\$ (148,400)	\$ 87,900
2011	0	20,800		-20,800	57,700	\$ -	\$ 8,400	\$ (29,200)	\$ 58,700
2012	14,400	9,800		4,600	62,300	\$ (14,400)	\$ -	\$ (9,800)	\$ 48,900
2013	100	15,200		-15,100	47,200	\$ 13,700	\$ 14,500	\$ (15,900)	\$ 33,000
2014	0	2,900		-2,900	44,300	\$ -	\$ -	\$ (2,900)	\$ 30,100
2016	80,200	0		80,200	124,500	\$ -	\$ -	\$ 80,200	\$ 110,300
2017	200	74,900		-74,700	49,800	\$ -	\$ -	\$ (74,700)	\$ 35,600
2018	0	1600		-1,600	48,200	\$ -	\$ -	\$ (1,600)	\$ 34,000
2019	0	5,800		-5,800	42,400	\$ -	\$ (5,800)	\$ -	\$ 34,000
2020	77,900	22,000		55,900	98,300	\$ -	\$ -	\$ 55,900	\$ 89,900
2021	0	64,200		-64,200	34,100	\$ -	\$ -	\$ (64,200)	\$ 25,700
2022	0	8,400		-8,400	25,700	\$ -	\$ (8,400)	\$ -	\$ 25,700
2024	91,600	14,700		76,900	102,600	\$ -	\$ -	\$ 76,900	\$ 102,600
2025	0	72,700		-72,700	29,900	\$ -	\$ -	\$ (72,700)	\$ 29,900
2028	0	18,900		-18,900	11,000	\$ -	\$ -	\$ (18,900)	\$ 11,000
2030	100	0		100	11,100	\$ -	\$ -	\$ 100	\$ 11,100
2031	0	100		-100	11,000	\$ -	\$ -	\$ (100)	\$ 11,000
2037	0	11,000		-11,000	0	\$ -	\$ -	\$ (11,000)	\$ -

Maximum Cumulative Reclamation Liability Bonding Calculations Print the "SELECTION"

	1988 Bonding Calculation			1998 Bonding Calculation		
		Total Escalated	Annual Escalated		Total Escalated	Annual Escalated
YEAR	88R x S x C	Dollars	Dollars	98A x S x C	Dollars	Dollars
1988	\$221,300			\$357,600		
1989		\$ 226,390	\$ 5,090		\$363,930	\$ 6,330
1990		\$ 231,597	\$ 5,207		\$366,732	\$ 2,802
1991		\$ 236,924	\$ 5,327		\$371,389	\$ 4,657
1992		\$ 242,373	\$ 5,449		\$379,597	\$ 8,208
1993		\$ 247,947	\$ 5,575		\$389,504	\$ 9,907
1994		\$ 253,650	\$ 5,703		\$402,008	\$ 12,503
1995		\$ 259,484	\$ 5,834		\$409,766	\$ 7,759
1996		\$ 265,452	\$ 5,968		\$419,683	\$ 9,916
1997		\$ 271,558	\$ 6,105		\$429,587	\$ 9,905
1998		\$ 277,804	\$ 6,246		\$439,210	\$ 9,623
1999		\$ 284,193	\$ 6,389		\$449,048	\$ 9,838
2000		\$ 290,729	\$ 6,536		\$459,107	\$ 10,059
2001		\$ 297,416	\$ 6,687		\$469,391	\$ 10,284
2002		\$ 304,257	\$ 6,841		\$479,905	\$ 10,514
2003		\$ 311,255	\$ 6,998		\$490,655	\$ 10,750
15 Years			\$ 90,000			\$ 133,100
Summary:						
Maximum Escalated Bonding Requirements 1988 Revision:					\$311,300	
Maximum Escalated Bonding Requirements 1998 Amendment:					\$490,700	
"Supplemental" Bonding Requirements 1998 Amendment (year 2000):					\$179,400	
Note:				Actual Escalation		
Three Year Escalation Average (1995 - 1997)				2.24%	1989	1.77%
Average Escalation Rate from 1989 thru 2003				2.13%	1990	0.77%
Variables:					1991	1.27%
"88R"	Maximum Liability 1988 Revision:			\$182,900	1992	2.21%
"98A"	Maximum Liability 1998 Amendment:			\$295,500	1993	2.61%
Note: above values are expressed in 1988 Dollars						
"S"	Supervision:		10.0%		1994	3.21%
"C"	Contingency:		10.0%		1995	1.93%
"E"	Escalation Rate:		2.3%		1996	2.42%
Sources:					1997	2.36%
1988 MRP Revision (pg. 69-70)					1998	2.24%
1998 Proposed MRP Amendment (pg. 70)					1999	2.24%
DOGM Letter of 12/21/88					2000	2.24%
Reclamation Contract Approval 2/3/89					2001	2.24%
					2002	2.24%
					2003	2.24%

SURETY ESTIMATE UPDATE

MINE OPERATOR NAME Brush Wellman

MINE NAME Topaz

FILE # M/023/003

COUNTY NAME Juab County

Prepared by Tom Munson

Last Update 11/14/88

DESCRIPTION:

This escalation reflects the maximum liability for Brush Wellman over and above their self bond of 311,300 dollars for the years 2001-3. The amount calculated in this spreadsheet over and above their self bond amount will be posted for the years 2001-2003. This amount works out to be 27,400 dollars. The following escalation calculation reflects the additional bond money needed for the years 2001-3, based on a consistent formula with the mine plan for Maximum liability. The Maximum Liability for the years 2001-2003 is 204,000 dollars. This amount times 10% supervision plus this amount times 10% contingency equals 246,840 dollars. This amount is then escalated from 1988 to 2003 below.

CALCULATIONS	YR	ESCAL FACTOR	BOND AMOUNT
$F = P(1 + i)^{**n}$	1987	0.0195	\$0
	1988	0.0181	\$246,840
	1989	0.0177	\$251,209
	1990	0.0077	\$253,143
	1991	0.0127	\$256,358
	1992	0.0221	\$262,024
	1993	0.0261	\$268,863
	1994	0.0321	\$277,493
	1995	0.0193	\$282,849
F = Future Sum	1996	0.0242	\$289,694
P = Present Sum	1997	0.0236	\$296,530
i = Escalation Factor	1998	0.0224	\$303,173
n = number of periods	1999	0.0224	\$309,964
	2000	0.0224	\$316,907
Three Yr Average = 2.24%	2001	0.0224	\$324,006
Used to Project 5 Yrs	2002	0.0224	\$331,263
From the Year 1998	2003	0.0224	\$338,684

SURETY ESTIMATE UPDATE

MINE OPERATOR NAME Brush Wellman

MINE NAME Topaz

FILE # M/023/003

COUNTY NAME Juab County

Prepared by Tom Munson

Last Update 11/14/88

DESCRIPTION:

This escalation reflects the maximum liability for Brush Wellman over and above their self bond of 311,300 dollars for the year 2000. The amount calculated in this spreadsheet over and above their self bond amount will be posted only for the year 2000. This amount works out to be 179,400 dollars. The following escalation calculation reflects the additional bond money needed for the years 2000, based on a consistent formula with the mine plan for Maximum liability. The Maximum Liability for the years 2000 is 295,500 dollars. This amount times 10% supervision plus this amount times 10% contingency equals 357,600 dollars. This amount is then escalated from 1988 to 2003 below.

CALCULATIONS	YR	ESCAL FACTOR	BOND AMOUNT
$F = P(1 + i)^n$	1987	0.0195	\$0
	1988	0.0181	\$357,600
	1989	0.0177	\$363,930
	1990	0.0077	\$366,732
	1991	0.0127	\$371,389
	1992	0.0221	\$379,597
	1993	0.0261	\$389,504
	1994	0.0321	\$402,008
	1995	0.0193	\$409,766
F = Future Sum	1996	0.0242	\$419,683
P = Present Sum	1997	0.0236	\$429,587
i = Escalation Factor	1998	0.0224	\$439,210
n = number of periods	1999	0.0224	\$449,048
	2000	0.0224	\$459,107
Three Yr Average = 2.24%	2001	0.0224	\$469,391
Used to Project 5 Yrs	2002	0.0224	\$479,905
From the Year 1998	2003	0.0224	\$490,655

